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SNOWMOBILE SKI AND BLADE CONSTRUCTION

(70)

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SNOWMOBILE SKI & BLADE CONSTRUCTION

Abstract of the Disclosure:

A blade for a snowmobile ski which consists of a narrow vertically disposed blade body adapted to be mounted on the longitudinal edge of a snowmobile ski in a position to depend downwardly. The forward portion of the blade curves upwardly to conform to the front of the ski. The blade is preferably provided with an integral horizontal web that is bolted or welded to the edge of the ski and lies in abutting face to face relationship with the ski.

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The present invention relates to the steering of motor powered snow
10 vehicles and to skis for such vehicles.

Almost all snowmobiles now being manufactured and sold employ a pair of skis at the front of the vehicle for steering. On a moderately slippery surface the skis have a tendency to allow the vehicle to slide or skid straight ahead even when the handlebars and skis are in the position for a full turn because of the weight of the vehicle and the large size of the track surface in engagement with the snow. To overcome this problem the invention has as its object the provision of an improved snowmobile and ski having the following characteristics and advantages: a) the ability to enable the vehicle to turn on a reduced turning radius when traveling over slippery packed snow or ice;
20 b) the provision of an added margin of safety by allowing improved steering control; c) a means for improving engagement between the ski and the snow when the vehicle makes a turn without increasing drag when the vehicle is not in a turn; d) the strengthening of the ski.

In the figures, Figure 1 is a perspective view of a snowmobile embodying the invention.

Figure 2 is a front elevational view of the ski of Figure 1.

Figure 3 is a plan view of the ski, and

Figure 4 is a perspective view of the ski.

Briefly, the present invention provides a snowmobile having a vehicle body



with propulsion means thereon and a steering ski mounted for turning about an inclined axis. The ski is provided with a drop center and at least one longitudinally extending laterally located downwardly depending steering blade is positioned on the side edge of the ski with its lower longitudinally extending edge located somewhat above the elevation of the drop center part of the ski.

In the figures, the snowmobile 10 includes the usual vehicle body 12, propulsion system 14, of which only the track can be seen, and a pair of ski supporting and steering shafts 16 and 18 mounted for pivotal movement upon axes that are parallel to one another and inclined such that their lower ends are located forwardly of their upper ends. The shafts 16 and 18 are secured as by welding at 20 and 22, respectively (Figs. 3 and 4) to tubes 24 and 26 mounted upon U shaped brackets 32 by pivot pins 30.

It can thus be seen that the position of the inclined steering shafts 16 and 18 will cause the skis mounted at their ends to tilt to the side when the shafts are turned by the handlebars.

Since the left and right skis are identical, only one will be described in detail.

Each U shaped bracket 32 includes parallel side portions 32a and 32b. Rigidly affixed to the lower surface of bracket 32 is a leaf spring 34 having its forward and rearward ends 34a and 34b respectively secured to laterally disposed pivots 36 and 38 which are supported upon brackets 40 and 42, respectively. Both of the brackets 40 and 42 are secured to the body of the ski 44 preferably by welding.

The ski 44 includes a pair of flat longitudinally extending coplanar side sections 46 and 48 which are co-extensive with a rear section 49 that is slightly upturned as seen in figure 4. The forward portions 46a and 48a of the side sections 46 and 48 respectively bend upwardly to define the forward part of the ski. The tip support comprising the steel rod 50 bent to the general form of a letter J is welded between the bracket 40 and the ski tip 52 to strengthen the front end of the ski and provide a handle.

The middle portion of the ski is provided with a trough or drop center

54, as best seen in Figures 1, 2 and 4. The drop center 54 extends longitudinally the full length of the ski, including the upturned forward portion defined by portions 46a and 48a but does not extend into the upturned portion 49.

A longitudinally extending rod 56, only a portion of which can be seen in Figures 1 and 2, is welded to the lower surface of the drop center 54 and extends the entire length of the ski to provide the ski with greater resistance to wear and abrasion.

As best seen in Figure 2, the drop center portion 54 supports the other
10 parts of the ski, including the side sections 46 and 48 a substantial distance above the surface of the snow 60 under hard packed conditions.

The steering blades in accordance with the invention will now be described.

Each ski 44 is provided with a pair of steering blades comprising the left and right steering blades 62 and 64. The blades 62 and 64 can be used either two to a ski or one to a ski. Each of the left blades 62 are identical, as are each of the right blades 64. Each left blade 62 consists of a vertically disposed longitudinally extending web 66 which is the functional portion of the blade and an integral horizontally disposed web 68 secured at longitudinally spaced intervals to section 46 of the ski by bolts 70 or other suitable
20 fasteners.

Both of the webs 66 and 68 bend upwardly the forward portion of the ski to conform to the upturned section 46a. It should be noted that the web 66 is located near the lateral edge of the ski and that its lower edge 72 is at a higher elevation than the lower edge of the drop center 54. This provision insures that the web 66 will not contact the ground when the skis are running straight ahead over a hard surface.

The right blades are constructed in a similar manner, including horizontal and vertical webs 80 and 82 respectively, secured to the horizontal sections 48 by bolts or other suitable fasteners 84. Both sections 80 and 82 bend
30 upwardly to conform to the forward portion of the ski. The lower edge 86 of web 82 is at a proper elevation to remain out of contact with the ground or hard packed snow 60 when the drop center rests on the ground.

Refer now to Figures 1 and 2 with regard to the manner in which the blades operate when the vehicle is in use. As shown in Figure 2, the blades 62 and 64 are out of contact with the snow when on a hard surface if in an upright vertical position. Whenever the vehicle is engaged in a turn as shown in Figure 1, owing to the angle of inclination of steering shafts 16 and 18, the skis 62 and 64 will tilt or cant to one side such that when a left run is being negotiated, their left lateral edges will be lower than their right lateral edges.

Thus, as seen in Figure 1, the right ski edges and blades 64 would be raised enough to be partially or entirely out of engagement with the snow 60 when a left turn is being made and a substantial portion of the weight of the vehicle will be transferred to the blades 62. Accordingly, the blade 62 will provide a highly effective engagement with the snow and enable the vehicle to turn on a radius that is virtually the same as its theoretical turning radius even when traveling at a high speed and in this way very effectively prevent the vehicle from side slipping as well as providing better steering control. Similarly, when the vehicle is making a right turn, blade 64 will be engaged with the snow and blade 62 will be elevated above the surface of the snow.

In summary, this invention makes possible sharp turns on hard packed snow or on ice as well as improving the steering control that can be obtained by the operator. Because blades 62 and 64 have their lower edges spaced above the elevation of drop center 54, they do not contact the ground and increase drag on the vehicle traveling straight ahead. Since the webs 66 and 82 are spaced relatively far apart, snow does not tend to compact between them.

If the skis are made of 16 gauge steel, blades 62 and 64 made of 12 gauge steel have been found suitable. Since most snowmobile skis are made of 16 gauge steel, it will be seen that the blades strengthen the ski substantially. The upwardly curved portions at the forward ends of the blades prevent damage by stones or other obstructions. While the dimension of the blades can be varied considerably, several hundred units in which the webs 66, 82 had a height of 3/4 inch performed admirably for extended periods of time.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. The combination of a snowmobile ski and a blade for said snowmobile ski, said blade adapted to be fixedly positioned in the vicinity of one lateral edge of the ski and to depend downwardly therefrom, said blade extending forwardly to substantially the forward tip of said ski and rearwardly along a major portion of the length of said ski, and having a lower edge adapted when the blade is mounted on said ski to be positioned at a higher elevation than the lowest part of the lowest surface of the ski, the forward portion of the blade being curved upwardly to conform to the front upwardly curved portion of the body of said ski to prevent damage from striking obstructions in the snow.

2. The combination of Claim 1 wherein a normally horizontally disposed web of sheet metal is integral with the blade body and is adapted when the blade is mounted on said ski to extend at right angles to the blade body from the upward edge thereof toward the centre of the ski, said web being adapted to be secured in face to face abutting relationship with the edge of said ski and thereby support the blade.

3. The combination of Claim 1 which includes a horizontally disposed web integral with the vertically disposed blade, said web adapted to be rigidly affixed to the ski and positioned in a face to face abutting relationship therewith.

4. The combination of a substantially straight snowmobile ski having a flat normally horizontally disposed elongated body formed from sheet material with an upwardly curved forward portion, a longitudinally extending drop centre supporting surface extending longitudinally of the ski and having a lower surface substantially below the lower surface of the lateral edges of the ski body, at least one longitudinally extending vertically disposed blade member fixedly positioned in the vicinity of one lateral edge of the ski and depending downwardly therefrom, said blade

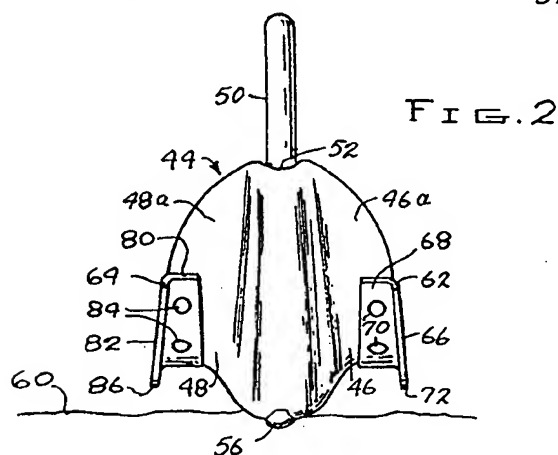
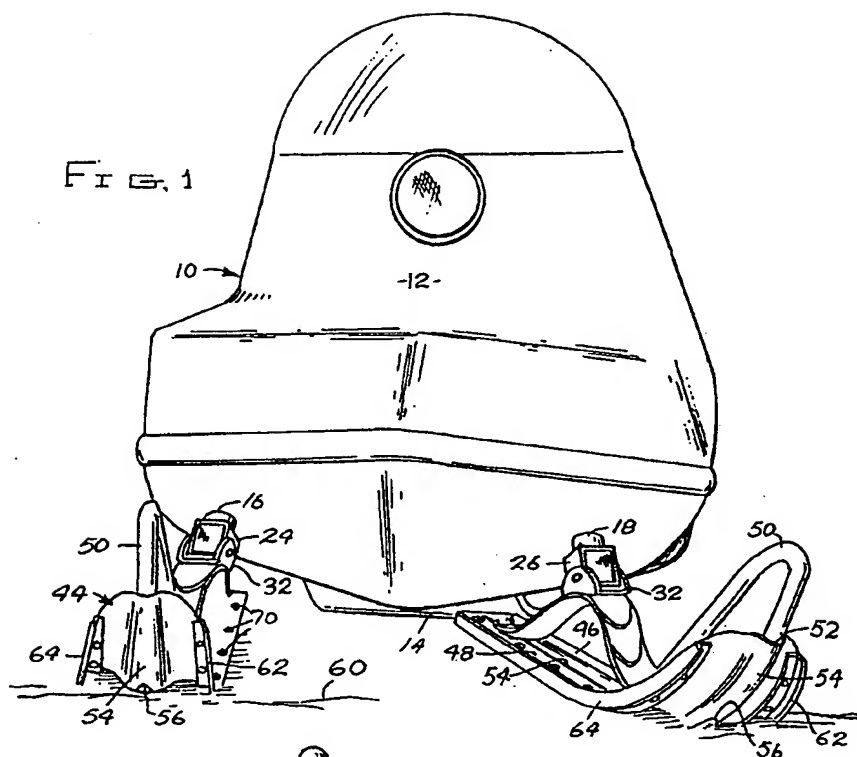
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extending forwardly to substantially the forward tip of the ski and rearwardly along a major portion of the length of said ski, and having a lower edge positioned at a higher elevation than the lower surface of the drop centre portion, the forward portion of the blade being curved upwardly to conform to the front upwardly curved portion of the ski body.

5. The combination of Claim 4 wherein a normally horizontally disposed web of sheet metal is integral with the blade body extends at right angles thereto from the upward edge thereof toward the ski centre, said web being adapted to be secured in face to face abutting relationship with the edge of the ski and thereby support the blade.

6. The combination of Claim 4 wherein said blade includes a horizontally disposed web integral with the vertically disposed blade, said web being rigidly affixed to the ski and being positioned in a face to face abutting relationship therewith.





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FIG. 3

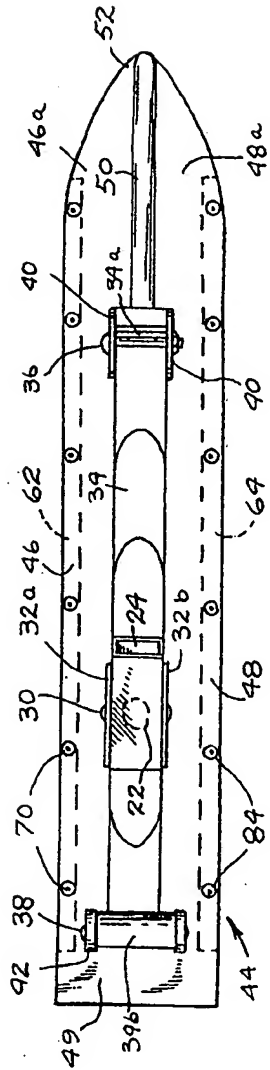
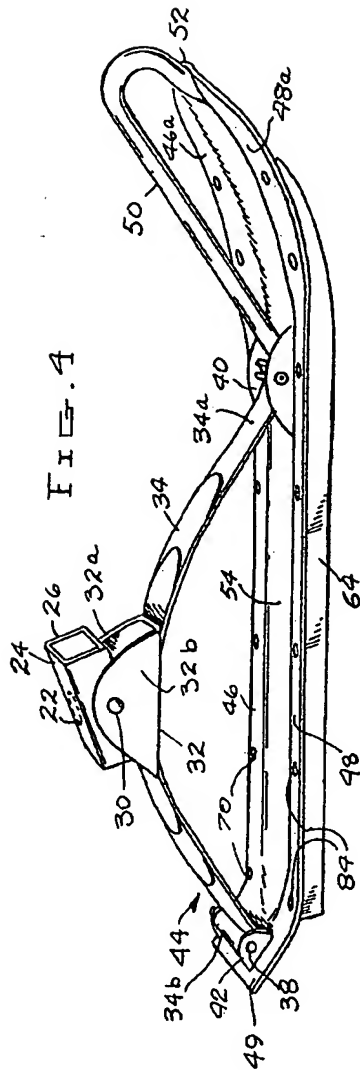


FIG. 4



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